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EXAMINER

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ART UNIT

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-11, 13-18 and 20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.

The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Independent claims 1 and 18 recited the limitation "wherein the backing plate and the sputter target have similar coefficients of thermal expansion" this limitation is not explicitly taught by the original disclosure and constitutes new matter.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-11, 13-18 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "similar" in claims 1 and 18 is a relative term which renders the claim indefinite. The term "similar" is not defined by the claim, the specification does not

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provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. It is unclear to the examiner as to what constitutes "similar" coefficients of thermal expansion.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-11, 13-18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogata et al. (JP-402043362A) (hereafter Ogata) and Applicant's Admitted Prior Art (hereafter AAPA) in view of Shindo et al. (US 2001/0032686A1) (hereafter Shindo).

Ogata teaches a disc shaped sputter target/backing plate assembly made by forming a plurality of segmented and spaced-apart ridges (3) within the surface of the periphery of the bonding surface of the backing plate (1) (Abstract; and Figures 2(1) and 2(2)). The ridges of Ogata inherently act as spacers/standoffs for the supply of soldering material between said backing plate and a sputter target. Ogata also teaches forming a sputter target with a substantially flat sputtering surface (2) and bonding surface, applying solder material (4) to the interface spaces and allowing the solder to solidify to form a bond (abstract and figure 1). Ridges are circular, arcuate (identified as semicircular in the abstract) or polygonal (figures 3-1 to 3-4) with heights and widths of

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about 0.02 to about 0.06 inches with a distance between ridges (pitch) of up to about 0.4 inches (abstract). Columns 7-8 of Ogata teach known soldering alloys.

Ogata does not teach that the sputter target is a ferromagnetic material; and the plurality of segmented and spaced-apart ridges are machined; however, Shindo teaches soldering a ferromagnetic sputtering target to a backing plate (paragraphs 1 and 63-64; and table 1). Shindo also teaches the sputtering target is selected from the group comprising titanium, aluminum, copper, molybdenum, cobalt, chromium, ruthenium, rhodium, palladium, silver, iridium, platinum, gold, tungsten, silicon, tantalum, vanadium, nickel, iron, manganese, germanium, and alloys thereof (paragraphs 1 and 63-64; and table 1); the backing plate is selected from the group consisting of copper, aluminum, titanium, and alloys thereof (paragraph 64); and the solder is liquid or paste selected from the group comprising tin-lead, indium-tin, tin-silver, tin-copper, or tin-silver-copper (paragraph 64). It should be noted that the backing plate and sputter target materials taught by Shindo above exhibit similar coefficients of thermal expansion. The solder is liquid during the bonding process. Additionally, AAPA teaches providing machined grooves (paragraph 7). Consequently, it would have been obvious to one of ordinary skill in the art to machine the grooves/ridges of Ogata. Furthermore, the claim would have been obvious because a particular known technique (machining grooves/ridges) was recognized as part of the ordinary capabilities of one skilled in the art.

At the time of the invention it would have been obvious to one of ordinary skill in the art to substitute the ferromagnetic sputter target material, the backing plate material and solder material as taught by Shindo for the materials of Ogata in order to form a

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sputter target/backing plate assembly which exhibits good magnetic properties and produces fewer particles during the sputtering process. Thus, the claim would have been obvious because the substitution of one known element for another would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Response to Arguments

Applicant's arguments filed 5/21/10 have been fully considered but they are not persuasive. The applicant argues that Ogata does not concern the uniform thickness of a target assembly in order to achieve optimal thickness and sheet resistance uniformity of sputtered films. In this regard, the presently claimed invention recites the spaced apart ridges machined into the backing plate and segmented to accommodate the solder supplied between the backing plate and the sputter target which is made of ferromagnetic materials. Thus, the sputtering target and the backing plate have similar coefficients of thermal expansion, and the ridges act as spacers to ensure a substantially uniform solder thickness. By comparison, Ogata simply provides channels (e.g., grooves or slots) in the bonding surface of the backing plate, which appear to extend over the entire surface of the backing plate for the purpose of minimizing warping that occurs during bonding of materials having a large difference in thermal expansion.

The applicant has failed to provide a persuasive argument or evidence that the ridges of Ogata will not act as stand-offs during the bonding process. Thus, the examiner maintains the position that the ridges of Ogata inherently act as

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spacers/standoffs for the supply of soldering material between the backing plate and the sputter target. Please note the similarities between Figure 1 of Ogata and Figure 2 of the instant application.

The applicant also argues that the materials bonded in Ogata are rare earth materials bonded to copper. These materials have a large difference in thermal expansion, and the bonding would create warping, but for the channels formed in the backing plate. By comparison, in the present invention it is a solder material which unites the backing plate and the sputtering target (e.g., materials having a similar thermal expansion) and leads to the use of an effective uniform thickness solder bonded interface.

In the rejection above, the examiner does not rely on Ogata to teach the materials of the backing plate and sputter target. Instead the examiner relies on Shindo to establish that it is well known in the art to form a backing plate/sputter target assembly from the claimed materials. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Additionally, the applicant argues that Ogata et al. does not disclose raised protrusions in the form of segmented space-apart ridges on the bonding surface of the backing plate to accommodate the solder and provide an uniform thickness interface.

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Neither the structure nor the processes of making the structure are the same as those suggested by Ogata et al.

As stated in the rejection above, it is the examiner's position that Ogata teaches a disc shaped sputter target/backing plate assembly made by forming a plurality of segmented and spaced-apart ridges (3) within the surface of the periphery of the bonding surface of the backing plate (1) (Abstract; and Figures 2(1) and 2(2)). The ridges of Ogata inherently act as spacers/standoffs for the supply of soldering material between said backing plate and a sputter target. The inherency of the ridges acting as spacers/standoffs results in an uniform thickness at the interface between the backing plate and sputter target. In addition to acting as stand-offs the ridges of Ogata minimize warpage and deformation. The applicant has failed to provide any evidence that the ridges of Ogata will not act as stand-offs during the bonding process.

The applicant also argues that Shindo relates to Ni-Fe sputtering targets for forming magnetic thin films, and specifically to a Ni-Fe sputtering target for forming ferromagnetic thin films. Col. 1, Ins. 15-18. Shindo et al. has been applied for purportedly disclosing soldering the backing plate and the target with In-Sn solder. Official Action at page 7. However, Shindo et al. does not disclose or suggest the features lacking in either Ogata et al. or Fukmnoto et al. taken alone or together.

The examiner respectfully disagrees with the applicant because the collective teachings of Ogata, AAPA and Shindo meet the limitations of the claims for the reasons set forth above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiley Stoner whose telephone number is 571-272-1183. The examiner can normally be reached Monday-Thursday (9:30 a.m. to 8:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on 571-272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status

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information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kiley Stoner/

Primary Examiner, Art Unit 1793